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EXAMINER

CROW, ROBERT THOMAS

ART UNIT

PAPER NUMBER

1634

NOTIFICATION DATE

DELIVERY MODE

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ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

IPOPS.LEGAL@agilent.com

Office Action Summary	Application No. 10/797,764	Applicant(s) THOMPSON ET AL.	
	Examiner Robert T. Crow	Art Unit 1634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 January 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) 1-25 is/are pending in the application.
 4a) Of the above claim(s) 16-17 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-15 and 18-25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 12 January 2009 has been entered.

Status of the Claims

2. This action is in response to papers filed 12 January 2009 in which claims 1, 3, 8-9, and 12-14 were amended, no claims were canceled, and no new claims were added. All of the amendments have been thoroughly reviewed and entered.

The previous rejections under 35 U.S.C. 112, first paragraph, are withdrawn in view of the amendments.

The previous rejections under 35 U.S.C. 103(a) not reiterated below are withdrawn in view of the amendments. Applicant's arguments have been thoroughly reviewed and are addressed following the rejections necessitated by the amendments.

Claims 1-15 and 18-25 are under prosecution.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 1-3, 5-6, 9, 13, and 18-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dahm et al (U.S. Patent No. 6,399,394, issued 4 June 2002) in view of Lyman et al (U.S. Patent No. 6,555,361 B1, issued 29 April 2003) and, as applied to claims 3 and 13, as evidenced by Caren et al (U.S. Patent Application Publication No. US 2002/0064889 A1, published 30 May 2002).

Regarding claim 1, Dahm et al teach an apparatus for holding a slide in the form of Figure 8, which shows cover member 30 (column 8, line 15- column 10, line 65),

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which is a substrate comprising front side 32 which is opposite substrate 10, which is a slide (column 13, lines 33-40). The backside of substrate 30 further has a support ridge in the form of the thicker middle part of substrate 30 containing bores 122 and 120 (column 9, line 45- column 10, line 65). At least one gasket in the form of gasket 60 is interposed between slide 10 and substrate 30, and a spacer in the form of guide pin 50 (Figure 8). The gasket, substrate and slide form chambers for hybridization (column 5, lines 15-30).

While Dahm et al teach the use of plastic substrates (column 13, lines 50-67), and thermoplastic gaskets (column 12, lines 50-65), Dahm et al do not explicitly teach thermoplastic substrates or that the height of the spacer is less than the height of the gasket.

However, Lyman et al teach an array hybridization apparatus (Title) comprising a thermoplastic substrate, wherein thermoplastics have the added advantage of providing resistance to the full range of conditions to which the apparatus is exposed (i.e., during hybridization procedures; column 4, lines 1-10). The apparatus further comprises a spacer in the form of raised ring 26, which is slightly shorter than the thickness of the o-ring gasket (Figure 3 and column 3, lines 10-60). The component that rests upon the gasket (i.e., the slide) rests upon spacer 28 because the seal formed between the component on the o-ring requires the slide to contact the o-ring, which is outside spacer 28 (Abstract, column 3, lines 10-35 and Figure 2). Thus, the o-ring gasket, the base portion substrate, the top portion slide and the raised ring define the chamber when the components are held together and the substrate is held flat. Lyman et al also

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teach the arrangement has the added advantage of allowing sealing of the device (Abstract). Thus, Lyman et al teach the known techniques of using thermoplastic substrates and spacer with heights that are less than the height of the gasket.

It would therefore have been obvious to a person of ordinary skill in the art at the time the claimed invention was made to have modified the apparatus as taught by Dahm et al with the thermoplastic substrates and gasket/spacer heights of Lyman et al to arrive at the instantly claimed apparatus with a reasonable expectation of success. Thus, modification would result in a spacer that is less than the height of the gasket such that the component that rests upon the gasket (i.e., the claimed slide) rests upon the spacer. The spacer is therefore between the substrate and the slide because the spacer is shorter than the gasket, which is between the substrate and the slide. The ordinary artisan would have been motivated to make the modification because said modification would have resulted in an apparatus having the added advantage of providing resistance to the full range of conditions to which the apparatus is exposed as well as allowing sealing of the device as explicitly taught by Lyman et al (column 4, lines 1-10 and Abstract). In addition, it would have been obvious to the ordinary artisan that the known technique of using the thermoplastic substrates and gasket/spacer heights of Lyman et al could have been applied to the apparatus of Dahm et al with predictable results because the thermoplastic substrates and gasket/spacer heights of Lyman et al predictably result in sealed devices stable to hybridization assay conditions.

Regarding claim 2, the apparatus of claim 1 is discussed above. Dahm et al teach the at least one gasket comprises a substantially deformable material; namely,

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the gasket is a thermoplastic gasket (column 12, lines 50-65). Page 7 of the instant specification states that “substantially deformable” has a similar meaning as “deformable,” and page 6 of the instant specification recites and embodiment wherein deformable gaskets are thermoplastic.

Regarding claim 3, the apparatus of claim 1 is discussed above. Figure 8 comprises four spacers (i.e., guide pins 50; column 10, lines 50-65), and the spacers 50 are part of the substrate 30 (Figure 8), which is made of the thermoplastic polypropylene in accordance with the teachings of Lyman et al (column 4, lines 1-10). Polypropylene is substantially non-deformable (i.e., is rigid) as evidenced by Caren et al (paragraph 0055). Thus, modification of the apparatus of Dahm et al with the teachings of the thermoplastic materials of Lyman et al results in four spacers made of a substantially non-deformable material.

Regarding claim 5, the apparatus of claim 1 is discussed above. Dahm et al also teach the at least one gasket is attached to the substrate; namely, the gasket is attached, via bonding, to the cover of Dahm et al, which is the substrate of the instant claims (column 5, lines 15-50).

Regarding claim 6, the apparatus of claim 1 is discussed above. Dahm et al further teach the at least one gasket comprises a portion of the substrate; namely, the gasket is permanently attached, via bonding, to the cover of Dahm et al, which is the substrate of the instant claims (column 5, lines 15-50). Because the binding is permanent, and because the gasket is thermoplastic (column 12, lines 50-65), the gasket comprises a portion of the thermoplastic substrate.

Regarding claim 9, the apparatus of claim 1 is discussed above. Dahm et al further teach the spacer is attached to the substrate; namely, substrate 30 carries the spacers 50 projecting from the front side (column 8, lines 25-30), wherein "carrying" is interpreted as "attached." In addition, it is noted that while column 8, lines 25-30 refers specifically to Figures 4-6, it would be obvious to the person of ordinary skill in the art at that the spacers of Figure 8 could also be "carried" (i.e., attached) to the front side of substrate 30 because Dahm et al teach the attachment of the spacers to the substrate.

Regarding claim 13, the apparatus of claim 1 is discussed above. Dahm et al teach all of the components of the apparatus are be made of the same material (i.e., metal). Spacer 50 is made of the thermoplastic polypropylene in accordance with the teachings of Lyman et al (column 4, lines 1-10). Polypropylene is substantially non-deformable (i.e., is rigid) as evidenced by Caren et al (paragraph 0055). Thus, modification of the apparatus of Dahm et al with the teachings of the thermoplastic materials of Lyman et al results in a spacer made of a plastic.

Regarding claim 18, the apparatus of claim 1 is discussed above. Dahm et al also teach a holder in the form of screw 100 (Figure 8) which has notches, in the form of functionally equivalent threads, to hold the slide and substrate in registered alignment when the hybridization chamber is defined because the screw hold the pieces together to form the chamber.

Regarding claim 19, the apparatus of claim 18 is discussed above. Dahm et al also teach the holder holds the substrate substantially flat when the hybridization

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chamber is defined; namely, the cover member (i.e., substrate) is held flat when the apparatus is assembled (column 5, lines 15-50).

Regarding claims 20-21, the apparatus of claims 1 and 18 is discussed above. Dahm et al also teach the holder further comprises a cover in the form of plate 80, which enables pressure to be applied to said slide for the purpose of defining the hybridization chamber because the cover 80 allows holder screws 100 to urge (i.e., pressure) the components of the apparatus together and form the array hybridization chamber (column 9, lines 45-67). In addition, it is noted that while column 9, lines 45-67 refers specifically to Figures 4-6, it would be obvious to the person of ordinary skill in the art at that the holder screws of Figure 8 could also be used to apply pressure to the apparatus because Dahm et al teach the screws are used with Figure 8.

Regarding claim 22, the apparatus of claim 6 is discussed above. Dahm et al further teach the at least one gasket is integral to the substrate; namely, the gasket is permanently attached, via bonding, to the cover of Dahm et al, which is the substrate of the instant claims (column 5, lines 15-50). Because the binding is permanent, the gasket is integrated with (i.e., integral to) the substrate.

Regarding claim 23, the courts have stated:

“[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.” *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985). See MPEP§ 2113.

While neither Dahm et al nor Lyman et al specifically teach injection molding of the substrate, these limitations are part of the process of making the substrate rather than structural limitations of the substrate. Because the prior art teaches the structural elements of the claim, the claim is obvious over the prior art.

Response to Arguments

Applicant's arguments filed 12 January 2009 (hereafter the "Remarks") have been fully considered but they are not persuasive for the reason(s) listed below.

A. It is noted that the Remarks are identical to the arguments filed 15 September 2008. Thus, the response to the Remarks presented below is also a complete response to the arguments filed 15 September 2008.

B. Applicant argues on page 8 of the Remarks that the references do not teach or suggest all of the claimed elements, that the references teach away from each other, that modification of Dahm et al results in a structure that will not work, and that the mere combination of references does not make the combination obvious.

However, page 8 of the Remarks provides no support for any of these arguments. MPEP 716.01(c) makes clear that "[t]he arguments of counsel cannot take the place of evidence in the record" (*In re Schulze*, 346 F.2d 600, 602, 145 USPQ 716, 718 (CCPA 1965)). Thus, Applicant's mere arguments cannot take the place of evidence in the record.

C. Applicant argues on pages 8-9 of the Remarks that an explicit disclosure is not required to teach away from a claimed invention.

However, pages 8-9 of the Remarks provide no support for the alleged teaching away. Thus, it is reiterated Applicant's mere arguments that cannot take the place of evidence in the record.

D. Applicant argues on pages 9-10 of the Remarks that because studs 50 (i.e., the claimed spacers) of Figure 8 also guide substrate 10, they naturally have a height that is greater than the gasket, which teaches away from the claimed invention.

However, it is noted that Applicant's citation of column 9, lines 34-36 specifically refers to Figures 4-6, and not to Figure 8, which is the figure cited in this Office Action. Thus, column 9 does not necessarily refer to the embodiment of Figure 8.

In addition, as noted in the previous Advisory Action, column 9 of Dahm et al specifically states that the apparatus of claims 4 through 6 "can be" used by aligning the components and assembling them together as "best illustrated" in Figure 5 (lines 22-25). The phrases "can be" and "best illustrated" clearly indicated that the examples and Figures presented are non-limiting embodiments, and thus do not limit the relationship of the spacer and gasket dimensions. Applicant's arguments regarding the alleged teaching away from a spacer having a height less than the gasket are not persuasive.,

E. Applicant also argues that Lyman et al teach that the slide must fit within a cavity defined by the spacer and hence the o-ring, which teaches away from the gasket and the spacer being disposed between the slide and substrate.

However, as noted in the rejection above, Lyman et al teaches a spacer in the form of raised ring 26, which is slightly shorter than the thickness of the o-ring gasket (Figure 3 and column 3, lines 10-60). The component that rests upon the gasket (i.e.,

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the slide) rests upon spacer 28 because the seal formed between the component on the o-ring is requires the slide to contact the o-ring, which is outside spacer 28 (Abstract, column 3, lines 10-35 and Figure 2).

Thus, as also noted in the rejection above, modification of the apparatus of Dahm et al with the teachings of Lyman et al would result in a spacer that is less than the height of the gasket such that the component that rests upon the gasket (i.e., the claimed slide) rests upon the spacer. The spacer is therefore between the substrate and the slide because the spacer is shorter than the gasket, which is between the substrate and the slide.

F. Applicant argues on page 10 of the Remarks that the combination of Dahm et al and Lyman et al teach or suggest a spacer interposed between the slide and the substrate.

However, as noted above, Lyman et al teach he component that rests upon the gasket (i.e., the slide) rests upon spacer 28 because the seal formed between the component on the o-ring is requires the slide to contact the o-ring, which is outside spacer 28 (Abstract, column 3, lines 10-35 and Figure 2).

Therefore, modification of the apparatus of Dahm et al with the teachings of Lyman et al would result in a spacer that is less than the height of the gasket such that the component that rests upon the gasket (i.e., the claimed slide) rests upon the spacer. The spacer is therefore between the substrate and the slide because the spacer is shorter than the gasket, which is between the substrate and the slide.

Therefore, contrary to Applicant's prior assertions and the assertions on page 10 of the Remarks, the propose combination of Dahm et al and Lyman et al teaches or suggests all of the claimed elements, the references do not teach away from each other, that modification of Dahm et al results in a structure will indeed work, and that the combination of references has proper motivation and thus makes the combination obvious.

6. Claims 4 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dahm et al (U.S. Patent No. 6,399,394, issued 4 June 2002) in view of Lyman et al (U.S. Patent No. 6,555,361 B1, issued 29 April 2003) as applied to claim 1 above, and further in view of Dickinson et al (U.S. Patent Application Publication No. US 2002/0102578 A1, published 1 August 2002).

Regarding claims 4 and 7, the apparatus of claim 1 is discussed above in Section 5.

Dahm et al also teach the at least one gasket is attached to the substrate; namely, the gasket is attached, via bonding, to the cover of Dahm et al, which is the substrate of the instant claims (i.e., claim 7; column 5, lines 15-50); however, neither Dahm et al nor Lyman et al teach the gasket is attached to said slide.

However, Dickinson et al teach an array hybridization apparatus for holding a slide, wherein a sealant in the form of gasket 94 (paragraph 0148). The sealant gasket is fixed to a lid (i.e., attached to a slide; paragraph 0148), and is also attached to the substrate by an adhesive (paragraph 0074). Dickinson et al also teach the attachment

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of the gasket to the slide has the added advantage of providing an airtight seal in the device (paragraph 0148), which would prevent the introduction of contaminants during use of the device. Thus, Dickinson et al teach the known technique of attaching a gasket to a slide.

It would therefore have been obvious to a person of ordinary skill in the art at the time the claimed invention was made to have modified the apparatus comprising a slide, a substrate, and a gasket (i.e., claim 4) and wherein the substrate is attached to the gasket (i.e., claim 7) as taught by Dahm et al in view of Lyman et al so that the gasket is attached to the slide as taught by Dickinson et al to arrive at instantly claimed apparatus with a reasonable expectation of success. The modification would result in a slide attached to a gasket (i.e., claim 4) that is also attached to the substrate (i.e., claim 7). The ordinary artisan would have been motivated to make the modification because said modification would have resulted in an apparatus having the added advantage of preventing the introduction of contaminants during use of the device as a result of providing an airtight seal in the device as explicitly taught by Dickinson et al (paragraph 0148). In addition, it would have been obvious to the ordinary artisan that the known technique attaching a gasket to a slide as taught by Dickinson et al could have been applied to the apparatus of Dahm et al in view of Lyman et al with predictable results because the known technique attaching a gasket to a slide as taught by Dickinson et al predictably results in a reliably sealed device.

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7. Claims 8 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dahm et al (U.S. Patent No. 6,399,394, issued 4 June 2002) in view of Lyman et al (U.S. Patent No. 6,555,361 B1, issued 29 April 2003) as applied to claim 1 above, and further in view of Gallagher et al (U. S. Patent Application Publication No. US 2003/0064507 A1, published 3 April 2003).

Regarding claims 8 and 12, the apparatus of claim 1 is discussed above in Section 5.

Dahm et al also teach the substrate is attached to the spacer; namely, substrate 30 carries the spacers 50 projecting from the front side (column 8, lines 25-30), wherein "carrying" is interpreted as "attached." In addition, it is noted that while column 8, lines 25-30 refers specifically to Figures 4-6, it would be obvious to the person of ordinary skill in the art at that the spacers of Figure 8 could also be "carried" (i.e., attached) to the front side of substrate 30 because Dahm et al teach the attachment of the spacers to the substrate (i.e., claim 12).

Neither Dahm et al nor Lyman et al teach the spacer is attached to the slide.

However, Gallagher et al teach a microfluidic device comprising substrate having a biological array (Figure 1) comprising a spacer that in part defines the volume of a microfluidic chamber, wherein the spacer is attached to the substrate and a membrane, which are functionally equivalent to the slide and substrate of the instant claims. Thus, Gallagher et al teach the known technique of having the spacer attached to the slide.

It would therefore have been obvious to a person of ordinary skill in the art at the time the claimed invention was made to have modified the apparatus comprising a slide,

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a substrate, and a spacer (i.e., claim 8) and wherein the substrate is attached to the spacer (i.e., claim 12) as taught by Dahm et al in view of Lyman et al so that the spacer is attached to the functional equivalent of a slide as taught by Gallagher et al to arrive at instantly claimed apparatus with a reasonable expectation of success. The modification would result in a slide attached to a spacer (i.e., claim 8) that is also attached to the substrate (i.e., claim 12). It would have been obvious to the ordinary artisan that the known technique attaching a spacer to a functional equivalent of a slide as taught by Gallagher et al could have been applied to the apparatus of Dahm et al in view of Lyman et al with predictable results because the known technique of attaching a spacer to the functional equivalent of a slide as taught by Gallagher et al predictably results in a proper spacing and support of a microfluidic chamber between the functional equivalents of a slide and a spacer.

8. Claims 10-11 and 24-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dahm et al (U.S. Patent No. 6,399,394, issued 4 June 2002) in view of Lyman et al (U.S. Patent No. 6,555,361 B1, issued 29 April 2003) as applied to claim 1 above, and further in view of Frye et al (U. S. Patent No. 6,272,939 B1, issued 14 August 2001).

Regarding claims 10-11, the apparatus of claim 1 is discussed above in Section 5.

Neither Dahm et al nor Lyman et al teach a plurality support ridges extending along the length of the length (i.e., claim 10) or the width (i.e., claim 10) of the thermoplastic backing.

However, Frye et al teach a plurality of support ridges on the bottom of a substrate acting as a backing for an apparatus having a chamber (Abstract); namely, Figure 1 shows an apparatus having a substrate in the form of base plate 150 which has a plurality of support ridges in the form of four feet 157 placed at each of the corners of the substrate (Figures 1 and 16). Because there are four feet at the four corners of the substrate, the feet are a plurality of ridges, wherein the plurality of ridges extends along the entire length (i.e., both long edges; claim 10) and the entire width (i.e., both short edges; claim 11). The ridges (i.e., feet) have the added advantage of allowing the apparatus to be stably supported on a surface such as a table (column 11, lines 5-20). Thus, Frye et al teach the known technique of providing a plurality support ridges extending along the length of the length (i.e., claim 11) or the width (i.e., claim 12) of the thermoplastic backing.

It would therefore have been obvious to a person of ordinary skill in the art at the time the claimed invention was made to have modified the apparatus as taught by Dahm et al in view of Lyman et al so that the bottom substrate has four feet in the corners of the bottom of the thermoplastic substrate as taught by Frye et al to arrive at instantly claimed apparatus with a reasonable expectation of success. Because there are four feet at the four corners of the substrate, the feet are a plurality of ridges, wherein the plurality of ridges extends along the entire length (i.e., both long edges;

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claim 10) and the entire width (i.e., both short edges; claim 11). The ordinary artisan would have been motivated to make the modification because said modification would have resulted in an apparatus having the added advantage allowing the apparatus to be stably supported on a surface such as a table as explicitly taught by Frye et al (column 11, lines 5-20). In addition, it would have been obvious to the ordinary artisan that the known technique of having support ridges (i.e., feet) on the bottom of the substrate as taught by Frye et al could have been applied to the apparatus of Dahm et al in view of Lyman et al with predictable results because the known technique of having support ridges (i.e., feet) on the bottom of the substrate as taught by Frye predictably results in a device that is easily used on a bench top.

Regarding claims 24-25, the apparatus of claims 10-11 is discussed above.

As noted above, the courts have stated that if the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process. While neither Dahm et al, Lyman et al, nor Frye et al specifically teach injection molding of the substrate, these limitations are part of the process of making the substrate rather than structural limitations of the substrate. Because the prior art teaches the structural elements of the claim, the claim is obvious over the prior art.

9. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Dahm et al (U.S. Patent No. 6,399,394, issued 4 June 2002) in view of Lyman et al (U.S. Patent No. 6,555,361 B1, issued 29 April 2003) as applied to claim 1 above, and further in view of Wilding et al (U.S. Patent No. 5,587,128, issued 24 December 1996).

Regarding claim 14, the apparatus of claim 1 is discussed above in Section 5.

Neither Dahm et al nor Lyman et al teach the height of the spacer is between 25 to 500 microns in height.

However, Wilding et al teach an array hybridization apparatus comprising a chamber having a height (i.e., depth) of between 25 and 1000 microns; namely, 300 microns (column 4, lines 36-60). Making a chamber having a height of 300 microns would require a spacer height of less than 300 microns. Wilding et al further teach a height of 300 microns has the added advantage of permitting efficient heat transfer to the contents of the chamber during assays (i.e., amplification; column 4, lines 36-60). Thus, Wilding et al teach the known technique of having a hybridization chamber that has a height of 300 microns, thus requiring a spacer of no more than 300 microns.

It would therefore have been obvious to a person of ordinary skill in the art at the time the claimed invention was made to have modified the apparatus comprising a chamber as taught by Dahm et al in view of Lyman et al so that the chamber is 300 microns in height as taught by Wilding et al to arrive at the instantly claimed apparatus with a reasonable expectation of success. The modification would result in a spacer having heights of 300 microns so that the chamber has a height of 300 microns. The ordinary artisan would have been motivated to make such a modification because said

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modification would have resulted in an apparatus having the added advantage of permitting efficient heat transfer to the contents of the chamber during assays as explicitly taught by Wilding et al (column 4, lines 36-60). In addition, it would have been obvious to the ordinary artisan that the known technique of having a 300 micron hybridization chamber as taught by Wilding et al could have been applied to the spacer height of the apparatus of Dahm et al in view of Lyman et al with predictable results because the known technique of having a 300 micron hybridization chamber as taught by Wilding et al predictably results in a device having a hybridization chamber with dimension known to be useful in hybridization assays.

10. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Dahm et al (U.S. Patent No. 6,399,394, issued 4 June 2002) in view of Lyman et al (U.S. Patent No. 6,555,361 B1, issued 29 April 2003) in view of Frye et al (U. S. Patent No. 6,272,939 B1, issued 14 August 2001) as applied to claim 11 above, and furthering view of Wilding et al (U.S. Patent No. 5,587,128, issued 24 December 1996).

Regarding claim 15, the apparatus of claim 11 is discussed above in Section 8.

Neither Dahm et al, Lyman et al, nor Frye et al teach the height of the chamber is between 25 to 1000 microns in height.

However, Wilding et al teach an array hybridization apparatus comprising a chamber having a height (i.e., depth) of between 25 and 1000 microns; namely, 300 microns (column 4, lines 36-60). Wilding et al further teach a height of 300 microns has the added advantage of permitting efficient heat transfer to the contents of the chamber

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during assays (i.e., amplification; column 4, lines 36-60). Thus, Wilding et al teach the known technique of having a hybridization chamber that has a height of 300 microns.

It would therefore have been obvious to a person of ordinary skill in the art at the time the claimed invention was made to have modified the apparatus comprising a chamber as taught by Dahm et al in view of Lyman et al and Frye et al so that the chamber is 300 micron in height as taught by Wilding et al to arrive at the instantly claimed apparatus with a reasonable expectation of success. The ordinary artisan would have been motivated to make such a modification because said modification would have resulted in an apparatus having the added advantage of permitting efficient heat transfer to the contents of the chamber during assays as explicitly taught by Wilding et al (column 4, lines 36-60). In addition, it would have been obvious to the ordinary artisan that the known technique of having a 300 micron hybridization chamber as taught by Wilding et al could have been applied to the apparatus of Dahm et al in view of Lyman et al and Frye et al with predictable results because the known technique of having a 300 micron hybridization chamber as taught by Wilding et al predictably results in a device having a hybridization chamber with dimension known to be useful in hybridization assays.

11. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Dahm et al (U.S. Patent No. 6,399,394, issued 4 June 2002) in view of Lyman et al (U.S. Patent No. 6,555,361 B1, issued 29 April 2003) as applied to claims 1, 6, and 22 above, and further in view of Mogard et al (U.S. Patent No. 6,216,905 B1, issued 17 April 2001).

It is noted that while claim 23 has been broadly rejected under 35 U.S.C 103(a) as described above in Section 5, the claim is also obvious using the alternative interpretation outlined below.

Regarding claim 23, the apparatus of claims 1, 6, and 22 is discussed above in Section 5.

While modification of the apparatus of Dahm et al in view of Lyman et al results in a thermoplastic substrate as described above in Section 8, neither Dahm et al nor Lyman et al teach the substrate is injection molded.

However, Mogard et al teach thermoplastic materials having fully integrated structures formed by injection molding have the added advantage of being a simple and economical form of production (column 8, lines 1-15). Thus, Mogard et al teach the known technique of using injection molding to form thermoplastic structures.

It would therefore have been obvious to a person of ordinary skill in the art at the time the claimed invention was made to have modified the apparatus comprising a thermoplastic substrate as taught by Dahm et al in view of Lyman et al so that the substrate is injection molded as taught by Mogard et al to arrive at the instantly claimed apparatus with a reasonable expectation of success. The ordinary artisan would have been motivated to make such a modification because said modification would have resulted in an apparatus having the added advantage of permitting simple and economical production of the substrate as explicitly taught by Mogard et al (column 8, lines 1-15). In addition, it would have been obvious to the ordinary artisan that the known technique of injection molding thermoplastics as taught by Mogard et al could

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have been applied to the thermoplastics of the apparatus of Dahm et al in view of Lyman et al and Frye et al with predictable results because the known technique of injection molding thermoplastics as taught by Mogard et al predictably results in a reliable method of producing the thermoplastic components.

12. Claims 24-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dahm et al (U.S. Patent No. 6,399,394, issued 4 June 2002) in view of Lyman et al (U.S. Patent No. 6,555,361 B1, issued 29 April 2003) in view of Frye et al (U. S. Patent No. 6,272,939 B1, issued 14 August 2001) as applied to claims 10 and 11 above, and further in view of Mogard et al (U.S. Patent No. 6,216,905 B1, issued 17 April 2001).

It is noted that while claims 24-25 have been broadly rejected under 35 U.S.C 103(a) as described above in Section 8, the claims are also obvious using the alternative interpretation outlined below.

Regarding claims 24-25, the apparatus of claims 10-11 is discussed above in Section 8.

While modification of the apparatus of Dahm et al in view of Lyman et al and Frye et al results in a thermoplastic substrate having support ridges as described above in Sections 8 and 11, neither Dahm et al nor Lyman et al teach the support ridges are injection molded.

However, Mogard et al teach thermoplastic materials having fully integrated structures formed by injection molding have the added advantage of being a simple and

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economical form of production (column 8, lines 1-15). Thus, Mogard et al teach the known technique of using injection molding to form thermoplastic structures.

It would therefore have been obvious to a person of ordinary skill in the art at the time the claimed invention was made to have modified the apparatus comprising a thermoplastic substrate having support ridges as taught by Dahm et al in view of Lyman et al so that the substrate and support ridges are fully integrated and made by injection molding as taught by Mogard et al to arrive at the instantly claimed apparatus with a reasonable expectation of success. The ordinary artisan would have been motivated to make such a modification because said modification would have resulted in an apparatus having the added advantage of permitting simple and economical production of the fully integrated substrate as explicitly taught by Mogard et al (column 8, lines 1-15). In addition, it would have been obvious to the ordinary artisan that the known technique of injection molding fully integrated thermoplastic devices as taught by Mogard et al could have been applied to the thermoplastics of the apparatus of Dahm et al in view of Lyman et al and Frye et al with predictable results because the known technique of injection molding fully integrating thermoplastic devices as taught by Mogard et al predictably results in a reliable method of producing the thermoplastic components.

Response to Arguments

Applicant's remaining arguments regarding the rejection of the dependent claims rely on the alleged deficiencies of Dahm et al in view of Lyman, which are addressed

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above. Because the arguments regarding Dahm et al in view of Lyman et al were not persuasive for the reasons presented above, the rejections of the remaining dependent claims are maintained for the reasons presented below.

Double Patenting

13. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

14. Claims 1-2, 8, and 13-15 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-3, 7, and 10-12 of copending Application No. 10/283,450 in view of Dahm et al (U.S. Patent No. 6,399,394, issued 4 June 2002) and in view of Lyman et al (U.S. Patent No. 6,555,361 B1, issued 29 April 2003).

Both sets of claims are drawn to an array hybridization apparatus comprising a slide, a substrate acting as a backing, a gasket, and a spacer having a height less than that of the gasket so that a hybridization chamber is formed, attachment of the spacer to the slide, plastics, spacer heights between 25 and 500 microns, and chamber heights between 25 and 1000 microns. The additional limitations of the '450 claims are encompassed by the open claim language "comprising" found in the instant claims.

The claims of the '450 application do not require the substrate to comprise a support ridge.

However, Dahm et al teach an apparatus for holding a slide in the form of Figure 8, which shows cover member 30 (column 9, line 45- column 10, line 65), which is a substrate comprising front side 32 which is opposite substrate 10, which is a slide (column 13, lines 33-40). The backside of substrate 30 further has a support ridge in the form of the thicker middle part of substrate 30 containing bores 122 and 120 (column 8, line 15- column 10, line 65). At least one gasket in the form of gasket 60 is interposed between slide 10 and substrate 30, and a spacer in the form of guide pin 50 (Figure 8). The gasket, substrate and slide form chambers for hybridization (column 5, lines 15-30). Dahm et al also teach the support ridge having the bores has the added advantage of allowing monitoring of assay conditions (column 10, lines 50-65). Thus, Dahm et al teach the known techniques of using a substrate comprising a support ridge.

It would therefore have been obvious to a person of ordinary skill in the art at the time the claimed invention was made to have modified the apparatus of the '450 claims to comprise the support ridge of Dahm et al to arrive at the instantly claimed apparatus

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with a reasonable expectation of success. The ordinary artisan would have been motivated to make the modification because said modification would have resulted in an apparatus having the added advantage of allowing monitoring of assay conditions as explicitly taught by Dahm et al (column 10, lines 50-65). In addition, it would have been obvious to the ordinary artisan that the known technique of using the substrate having the support ridge of Dahm et al could have been applied to the apparatus of the '450 claims with predictable results because the known technique of using the substrate having the support ridge of Dahm et al predictably results in sealed devices stable to hybridization assay conditions.

While Dahm et al teach the use of plastic substrates (column 13, lines 50-67), and thermoplastic gaskets (column 12, lines 50-65), Dahm et al do not explicitly teach thermoplastic substrates or that the height of the spacer is less than the height of the gasket.

However, Lyman et al teach an array hybridization apparatus (Title) comprising a thermoplastic substrate, wherein thermoplastics have the added advantage of providing resistance to the full range of conditions to which the apparatus is exposed (i.e., during hybridization procedures; column 4, lines 1-10). The apparatus further comprises a spacer in the form of raised ring 26, which is slightly shorter than the thickness of the o-ring gasket (Figure 3 and column 3, lines 10-60). Thus, the o-ring gasket, the base portion substrate, the top portion slide and the raised ring define the chamber when the components are held together and the substrate is held flat. Lyman et al also teach the arrangement has the added advantage of allowing sealing of the device (Abstract).

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Thus, Lyman et al teach the known techniques of using thermoplastic substrates and spacer with heights that are less than the height of the gasket

It would therefore have been obvious to a person of ordinary skill in the art at the time the claimed invention was made to have modified the apparatus of the '450 claims in view of Dahm et al with the thermoplastic substrates and gasket/spacer heights of Lyman et al to arrive at the instantly claimed apparatus with a reasonable expectation of success. The ordinary artisan would have been motivated to make the modification because said modification would have resulted in an apparatus having the added advantage of providing resistance to the full range of conditions to which the apparatus is exposed as well as allowing sealing of the device as explicitly taught by Lyman et al (column 4, lines 1-10 and Abstract). In addition, it would have been obvious to the ordinary artisan that the known technique of using the thermoplastic substrates and gasket/spacer heights of Lyman et al could have been applied to the apparatus of the '450 claims in view of Dahm et al with predictable results because the thermoplastic substrates and gasket/spacer heights of Lyman et al predictably result in sealed devices stable to hybridization assay conditions.

This is a provisional obviousness-type double patenting rejection.

Conclusion

15. No claim is allowed.

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Robert T. Crow whose telephone number is (571)272-

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1113. The examiner can normally be reached on Monday through Friday from 8:00 am to 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ram Shukla can be reached on (571) 272-0735. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Robert T. Crow/
Examiner, Art Unit 1634

Robert T. Crow
Examiner
Art Unit 1634